Amendments to the Claims

1-16. (Cancelled)

17. (Currently amended) Apparatus for analysing a polynucleotide, the apparatus comprising: a support having an impermeable surface; porous material attached to the impermeable surface; and an array of oligonucleotides with predetermined sequences attached to the porous material, wherein the array comprises at least two defined cells, the sequence of the oligonucleotides of a first cell is different from the sequence of the oligonucleotides of a second cell, and the oligonucleotides are shorter than the polynucleotide.

18. (Previously presented) Apparatus of claim 17, wherein the porous material is a microporous material.

19. (Previously presented) Apparatus of claim 17, wherein the support is made of a silicon oxide.

20. (Previously presented) Apparatus of claim 19, wherein the support is made of glass.

21. (Previously presented) Apparatus of claim 17, comprising between 72 and 1.1 x 10^{12} cells.

22. (Previously presented) Apparatus of claim 17, wherein each cell holds at least $3x10^{-12}$ mmol of oligonucleotide.

23. (Previously presented) Apparatus of claim 17, wherein the oligonucleotides are covalently attached to the porous material.

24. (Previously presented) Apparatus of claim 23, wherein the oligonucleotides are covalently attached by a terminal nucleotide.

25. (Previously presented) Apparatus of claim 17, wherein the oligonucleotides are synthesized *in situ*.

26. (Previously presented) Apparatus of claim 17, wherein the apparatus is manufactured using a computer-controlled device.

27. (Previously presented) Apparatus of claim 26, wherein the computer-controlled device is a printing device.

28. (Previously presented) A method of making an array of oligonucleotides, which method comprises: attaching a plurality of oligonucleotides to a porous material that is attached to an impermeable surface of a support, the oligonucleotides having different predetermined sequences and being attached to the porous material at different known locations on the surface of the support through a computer-controlled printing device.

29. (Previously presented) Method of claim 28, wherein the porous material is a microporous material.

30. (Previously presented) Method of claim 28, wherein the support is made of a silicon oxide.

31. (Previously presented) Method of claim 30, wherein the support is made of glass.

32. (Previously presented) Method of claim 28, comprising between 72 and 1.1×10^{12} known locations.

33. (Previously presented) Method of claim 28, wherein the computer-controlled printing device delivers at least 3×10^{-12} mmol of oligonucleotide to the known locations.

34. (Previously presented) Method of claim 28, wherein the computer-controlled printing device is a plotter or an ink-jet printer.

35. (Previously presented) Method of claim 28, wherein the oligonucleotides are covalently attached to the porous material.

36. (Previously presented) Method of claim 35, wherein the oligonucleotides are covalently attached by a terminal nucleotide.

37. (Currently amended) An apparatus for analysing a polynucleotide, the apparatus comprising an impermeable support segregated into at least two defined cells, the cells having oligonucleotides containing predetermined sequences which are covalently attached thereto, wherein the sequence of the oligonucleotides of a first cell is different from the sequence of the oligonucleotides of a second cell.

38. (Previously presented) Apparatus of claim 37, wherein the cells have a size of about 10μm to about 100μm.

39. (Previously presented) Apparatus of claim 37, wherein the impermeable support is glass.

40. (Previously presented) Apparatus of claim 37, wherein each oligonucleotide is bound to the support by a covalent link through a terminal nucleotide.

41. (Previously presented) Apparatus of claim 37, comprising between 72 and 1.1 x 10^{12} cells.

42. (Previously presented) A method for analysing a polynucleotide, comprising the steps of:

- labelling the polynucleotide or fragments of the polynucleotide, to produce labelled nucleic acid;
- applying the labelled nucleic acid under hybridisation conditions to the array of claim 37; and
- observing the cells in the array to which the labelled nucleic acid hybridises.

43. (Previously presented) The method of claim 42, wherein the polynucleotide is randomly degraded to form a mixture of oligonucleotides of chosen lengths, the mixture being thereafter labelled to form labelled nucleic acid which is applied to the array.

44. (Previously presented) The method of claim 42, wherein the polynucleotide or fragments of the polynucleotide are labelled with ^{32}P or a fluorescent label.

45. (Previously presented) The method of claim 42, wherein the polynucleotide or fragments of the polynucleotide are populations of mRNA, genomic DNA, or PCR products.

46. (Currently amended) An array of oligonucleotides comprising a support having an impermeable surface to which a plurality of oligonucleotides with predetermined sequences are attached, the oligonucleotides having different nucleotide sequences and being attached at different known locations on the surface of the support, wherein the oligonucleotide at one known location is different from the oligonucleotide at another known location.

47. (Currently amended) An array of oligonucleotides comprising a support having a surface to which the oligonucleotides are attached, wherein the oligonucleotides having different predetermined nucleotide sequences are attached at between 72 and 1.1×10^{12} different known locations on the surface of the support.

48. (Currently amended) An array of oligonucleotides for analysing mutations of a gene having a known nucleotide sequence, comprising a support having an impermeable surface to which are attached at different known locations a set of overlapping or partly overlapping or non-overlapping oligonucleotides with predetermined sequences which are complementary to a segment of the known nucleotide sequence of the gene.

49. (Previously presented) The array of claim 46, wherein the different known locations are spaced apart by 10-100 μm.

50. (Previously presented) The array of claim 47, wherein the different known locations are spaced apart by 10-100 μm.

51. (Previously presented) The array of claim 48, wherein the different known locations are spaced apart by 10-100 μm.

52. (Cancelled)

53. (Cancelled)

54. (Cancelled)

55. (Previously presented) The array of claim 46, wherein the oligonucleotides are attached at the different known locations using a computer-controlled application device.

56. (Previously presented) The array of claim 47, wherein the oligonucleotides are attached at the different known locations using a computer-controlled application device.

57. (Previously presented) The array of claim 48, wherein the oligonucleotides are attached at the different known locations using a computer-controlled application device.

58. (Previously presented) The array of claim 46, wherein the support is made of glass.

59. (Previously presented) The array of claim 47, wherein the support is made of glass.

60. (Previously presented) The array of claim 48, wherein the support is made of glass.

61. (Previously presented) The array of claim 46, wherein each oligonucleotide is attached by a covalent link through a terminal nucleotide residue on the surface of the support.

62. (Previously presented) The array of claim 47, wherein each oligonucleotide is attached by a covalent link through a terminal nucleotide residue on the surface of the support.

63. (Previously presented) The array of claim 48, wherein each oligonucleotide is attached by a covalent link through a terminal nucleotide residue on the surface of the support.

64. (Previously presented) A method of making an array of oligonucleotides, which comprises:

- attaching a plurality of oligonucleotides to an impermeable surface of a support, the oligonucleotides having different predetermined sequences and being attached at different known locations on the surface of the support,
- wherein the oligonucleotides are synthesized before attachment to the surface of the support.

65. (Previously presented) A method of making an array of oligonucleotides, which comprises:

- attaching a plurality of oligonucleotides to an impermeable surface of a support, the oligonucleotides having different predetermined sequences and being attached at different known locations on the surface of the support,
- wherein the oligonucleotides are synthesized in situ on the surface of the support.

66. (Previously presented) A method of making an array of oligonucleotides, which comprises attaching oligonucleotides to a surface of a support, the oligonucleotides having different predetermined sequences and the oligonucleotides being attached at between 72 and 1.1×10^{12} different known locations on the surface of the support.

67. (Previously presented) The method of claim 66, wherein the surface of the support is impermeable.

68. (Previously presented) The method of claim 64, wherein the different known locations are spaced apart by 10-100 μm.

69. (Previously presented) The method of claim 65, wherein the different known locations are spaced apart by 10-100 μm.

70. (Previously presented) The method of claim 66, wherein the different known locations are spaced apart by 10-100 μm.

71. (Previously presented) The method of claim 64, wherein the support is made of glass.

72. (Previously presented) The method of claim 65, wherein the support is made of glass.

73. (Previously presented) The method of claim 66, wherein the support is made of glass.

74. (Previously presented) The method of claim 64, wherein each oligonucleotide is attached by a covalent link through a terminal nucleotide residue on the surface of the support.

75. (Previously presented) The method of claim 65, wherein each oligonucleotide is attached by a covalent link through a terminal nucleotide residue on the surface of the support.

76. (Previously presented) The method of claim 66, wherein each oligonucleotide is attached by a covalent link through a terminal nucleotide residue on the surface of the support.

77. (Currently amended) A method of making an array of oligonucleotides with predetermined sequences, which method comprises:

a) applying a mask to an impermeable surface of a support thereby to define a first exposed region of the surface to which a first nucleotide residue is coupled,

b) off-setting the mask thereby to define a second exposed region of the surface to which a second nucleotide residue is coupled, and

c) repeating step b) until the desired array of oligonucleotides has been made.

78. (Previously presented) A method of comparing polynucleotide sequences, which method comprises: applying the polynucleotides to an array of oligonucleotides under hybridizing conditions, wherein the oligonucleotides have different predetermined sequences and are attached at different known locations on an impermeable surface of a support; and observing the differences between the patterns of hybridisation, wherein the polynucleotides are DNA.

79. (Previously presented) A method of comparing polynucleotide sequences, which method comprises: applying the polynucleotides to an array of oligonucleotides under hybridizing conditions, wherein the oligonucleotides have different predetermined sequences and are attached at different known locations on an impermeable surface of a support; and observing the differences between the patterns of hybridisation, wherein the polynucleotides are RNA.

80. (Previously presented) A method for determining the sequence of a polynucleotide, which comprises:

- applying the polynucleotide to a substrate having an impermeable surface to which are immobilised a plurality of oligonucleotide probes having different predetermined sequences under hybridisation conditions, wherein the probes are immobilised at different known locations on the surface of the support such that the oligonucleotide at one known location is different from the oligonucleotide at another known location,
- detecting the oligonucleotide probes to which the polynucleotide hybridizes, and
- determining the sequence of the polynucleotide based upon the known sequence of the oligonucleotide probe to which the polynucleotide hybridizes.

81. (Previously presented) The method of claim 80, wherein the polynucleotide is labelled.

82. (Currently amended) A kit for analysing a polynucleotide comprising: an array of oligonucleotides comprising a support having an impermeable surface to which a plurality of oligonucleotides are attached, the oligonucleotides having different predetermined nucleotide sequences and being attached at different known locations on the surface of the support; apparatus for hybridisation of the polynucleotide to the array; and a scanner for detecting hybridisation.

83. (Currently amended) A kit for analysing a polynucleotide comprising: an array of oligonucleotides comprising a support having a surface to which the oligonucleotides are attached, wherein the oligonucleotides having different predetermined nucleotide sequences are attached at between 72 and 1.1×10^{12} different known locations on the surface of the support; apparatus for hybridisation of the polynucleotide to the array; and a scanner for detecting hybridisation.

84. (Currently amended) A kit for analysing mutations of a gene comprising: an array of oligonucleotides having a known nucleotide sequence comprising a support having an impermeable surface to which are attached at different known locations a set of overlapping or partly overlapping or non-overlapping oligonucleotides with predetermined sequences which are complementary to a segment of the known nucleotide sequence of the gene; apparatus for hybridisation of the polynucleotide to the array; and a scanner for detecting hybridisation.

85. (Previously presented) The kit of claim 82, 83 or 84, including also computer software and/or computer hardware for analysing the results.